

# CHILDHOOD OBESITY



PEDIATRICIANS ON THE FRONTLINE

A PANDEMIC

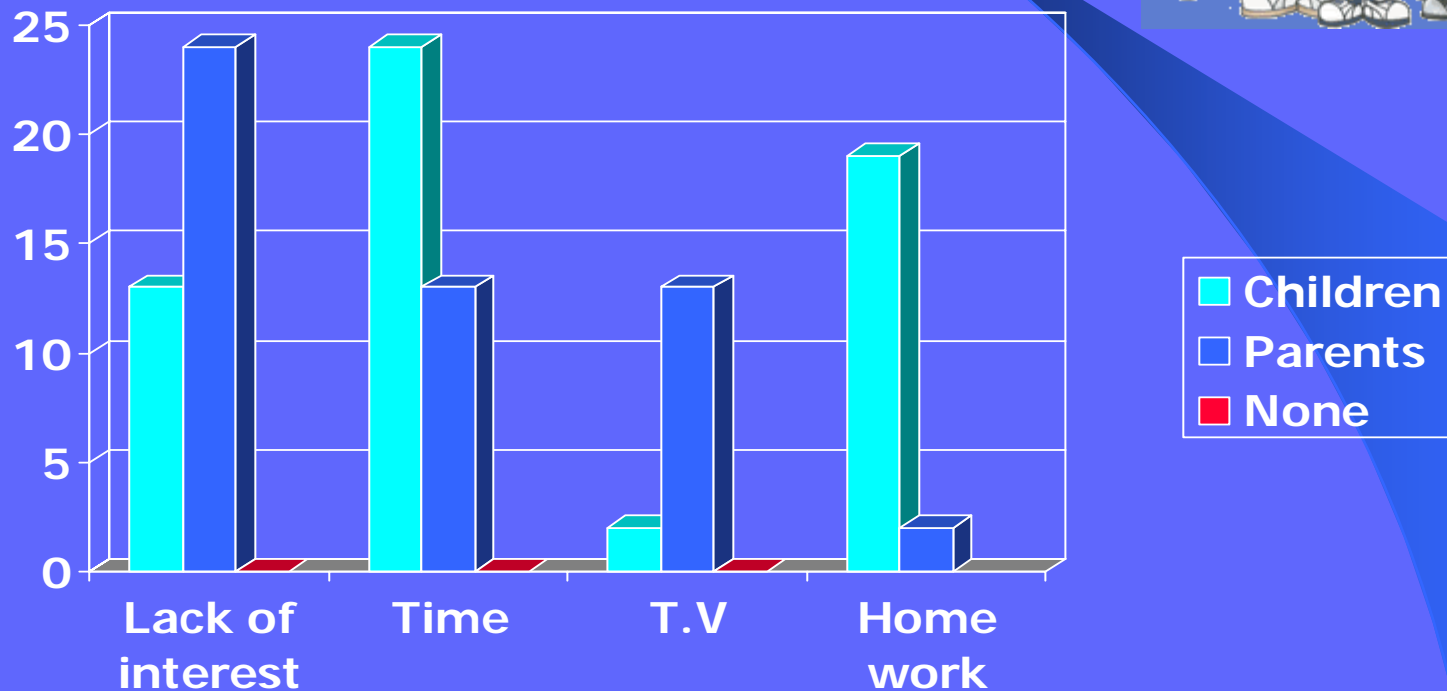
LYDIE L. HAZAN, MD



***“Obesity is a  
health hazard  
that costs MORE  
THAN \$100  
BILLION a year in  
medical  
expenses.”***



National statistics show that 12 to 25% of U.S. children and teens are considered overweight and 15% obese.



# Girth of a Nation

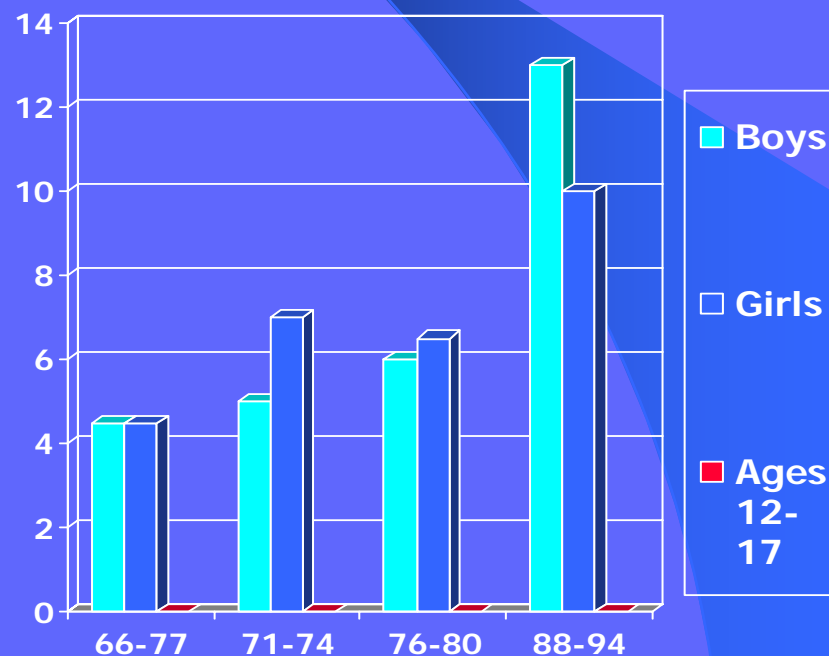
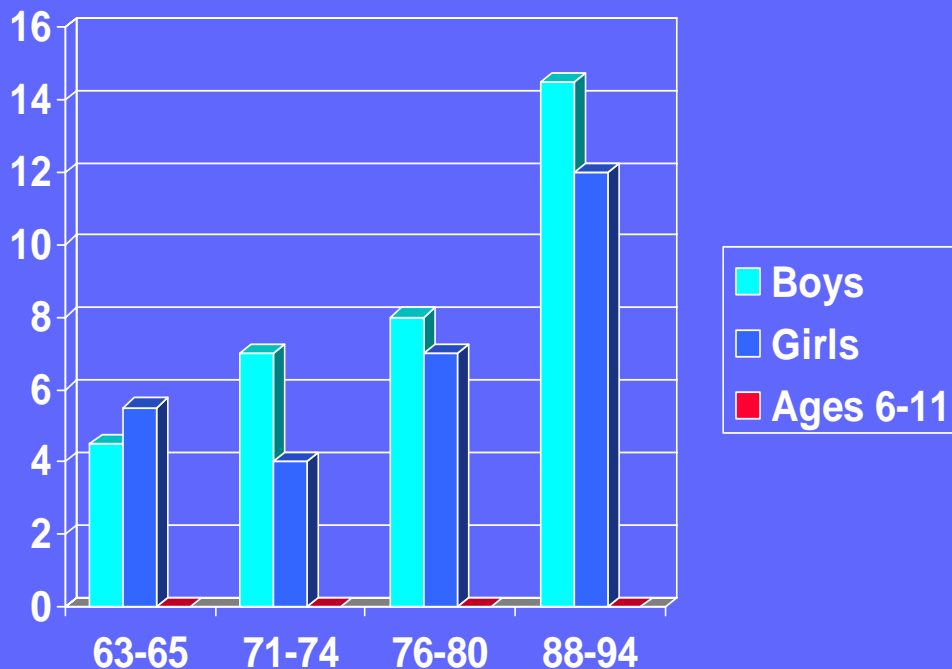


In 1991 only 4 states  
had obesity rates  
over 14%.

By 1998, 37 States  
through out the  
U.S. had hit that  
threshold!



The percentage of American kids who are obese has more than doubled since the 1960's.



# Factors Related to the Onset of Obesity



- Altered dietary intake
- Decreased physical activity
- Increased inactivity



# Shifts in Food Practices in the United States



- Fast food consumption
- Reduced frequency of family meals
- Consumption of soft drinks-increased from 27 to 44 gal/y from 1972-1992
- 30,000 products in supermarkets
- Increased portion size



# Daily Physical Education Class in Schools (Grades 9-12th)



<u>YEAR</u>	<u>%</u>
1991	42%
1997	27%



# Can we predict which child will become obese?



# Risk Associated w/ Parental obesity

Whitaker, Dietz, Seidel et al.

NEJM volume 337, pp 869-873 Sept 25, 1997



1-2 yr olds (non obese) + One obese parent

=> 28 % chance of becoming an obese adult

Efforts should aim at preventing obesity

3-5 yr olds (obese) + One obese parent

=> 62% chance of adult obesity vs. 24% if neither parent is obese



# Age Paradigms

Kries et al. BMJ 319:147-150

Newborn period:

9357 5-6 yr old German children-

If BF \* 2 mos : 3.8% risk of child. obesity

If BF \* >12 mos. : 0.8% risk



Parental obesity plays a role up to age 10

After 10 yrs of age, the child's obesity status and NOT the parents leads the decision for or against treatment



# The Obesity Epidemic Does Not Discriminate



**TERESA**

Date : 10-23-01  
Age : 17  
Weight : 257 lbs.  
Height : 5'6"  
BMI : 41.5



**GLENISHA**

Date : 05-24-01  
Age : 15  
Wt : 395 lbs.  
Ht : 5'4"  
BMI : 68



**CLINT**

Date : 09-09-01  
Age : 9  
Weight : 236 lbs  
Height : 5'2"  
BMI : 43



# Nor for Race or Age...



# Our Dilemmas in Pediatrics

- Do Children today outgrow their weight?
- Can we as pediatricians, really make an impact, and in a 15 minute visit?
- What diet if any, do we recommend?
- Is there even a point in raising the issue if the parent is non cooperative, or the environment hostile to change?
- Do medications play a role in the management of childhood obesity? If so, will there be a potential for abuse? What are the risks and benefits involved?
- If we treat obesity, are we really preventing future illness or just delaying the inevitable?



# Prevention is Key



A majority of preventable health risk factors are associated with childhood obesity!



# 1. Type 2 Diabetes



- ✓ Insulin sensitivity in prepubertal and pubertal children correlates inversely with BMI and % body fat.

- Arsianian, S. and Suprasongsin, C. JCEM 81: 1058, 1996
- Caprio et al. Diabetologia 39:1489, 1996
- Sinaiko et al. J Pediatr 139:700, 2001

- ✓ Severe obesity in prepubertal children and adolescents associated with IGT(21-25%) and unsuspected type 2 diabetes(4% of teenagers)

- Sinha et al. N Eng J Med 346: 802, 2002



# Jackeline



09-16-00  
Age: 12 yrs.  
Height: 5'6"  
Weight: 327 lbs.  
BMI: 52.1  
Dx:  
Morbidly Obese  
Type 2 Diabetes  
Hypertension



## 2. Hypertension

- Hypertension is 9 times more frequent among obese children than non- obese children.
- Approx. 20-30% of obese children ages 5-11 have hypertension.
- Hyperinsulinemia which affects sodium retention and is a cause of hypertension, is 12.6 times more likely in obese children.
- When both obese and non- obese adolescents were shifted from salt to a low salt diet, a significantly larger decrease in blood pressure was observed among obese compared to a non-significant change among non obese adolescents.



# Alex



- 12-18-02
- Age : 13
- Height : 5'7"
- Weight : 324 lbs.
- BMI : 51
- DX : M.O
- (Morbid obesity)
- HTN (152/78)
- Fmhx of type 2DM



## 2B. Hypertension

- New medications are on the rise for the treatment of essential hypertension:

ACEI, ACE II etc..

i.e. Altace (Ramipril).

Fosinopril, Irbesartan etc...



### 3. Asthma



- The diagnosis of Asthma is significantly more prevalent in children and adolescents who are overweight.
- The studies are clear: If a child has asthma and is overweight, losing weight will decrease his or her frequency of emergency room visits.



# 4. Abnormal cholesterol levels (dyslipidemia)



- The Bogalusa Heart Study showed that being overweight during adolescence was associated with a 2.4 time increase in the prevalence of total cholesterol values above 240mg/dl
- A 3- fold risk of increase in LDL values above 160mg/dl
- An 8- fold risk of decrease in HDL levels below 35mg/dl in adults age 27-31.



# Yale



09-09-01

Age : 10

Height : 5'0"

Weight : 133 lbs.

BMI : 26.1

DX : Obesity

High Cholesterol



## 5. Syndrome X



- ✓ Obese children and adolescents are at a high risk for Syndrome X.
- ✓ This syndrome is characterized by dyslipidemia, hypertension, hyperinsulinemia and obesity.



# Aaron



- 09-09-00
- Age: 12
- Height: 5'0"
- Weight: 228.4 lbs.
- BMI: 43.9
- DX:
  - Morbid Obesity
  - Hypertension
  - Insulin Resistant
  - Hyperlipidemia



## 6. Sleep Apnea



- Sleep-associated breathing disorders such as apnea, hypopnea, excessive nightmare arousal, or abnormalities of gas exchange have been associated with obesity.
- One study reported 30% of obese subjects having sleep-apnea and another 30% showing abnormal sleep patterns.
- Another study found that 94% of obese subjects demonstrated abnormal sleep patterns.
- Preliminary results indicate that obese children with obstructive sleep-apnea have clinically significant deficits in learning and memory compared to obese children without apnea.



# 7. Menstrual Abnormalities



- Menstrual abnormalities in obese children are common.
- Most obese girls will have their menstrual period at an earlier age.
- Late or absent menstruation is also associated with obesity.
- Approx. 40-60% of adult women with Polycystic Ovarian Syndrome (PCO) are overweight or obese.



# 8. Gall Bladder Disease



- Obesity accounts for 8-33% of gallstones observed in children.
- Childhood obesity accounts for the majority of gallstones occurring in children without underlying medical conditions such as hemolytic disease, congenital heart disease or prolonged nutritional support.
- Obese individuals have increased biliary excretion of cholesterol resulting in an increased likelihood of gallstone formation.



# 9. Orthopedic Complications



- Obesity causes many orthopedic complications.
- 30% to 50% of patients with slipped capital epiphyses are obese.
- In a study of Blount's disease (severe bowing of the legs) approx 80% of the patients were obese.



# 10a. Eating Disorders



- Emphasis on weight is everywhere in our society.
- As the medical profession takes steps to help obese children it is important to realize and monitor the effect that weight consciousness may be having.



# 10b. Eating Disorders



- Eating disorders affect 5-10% of our teenagers. Overweightness and Obesity : 25-30%.
- 80% of Overweight or Obese teenagers become Overweight or more so Obese adults.
- 28.6% of girls and 27.8% of boys who met criteria for binge eating syndrome reported attempting suicide



Ackard et al. Pediatrics Vol.111 No1Jan 2003

# 11. Psychosocial Effects



- Obesity may cause inappropriate expectations and adverse socialization because the children look old for their age.
- The children report negative assumptions made about them by others due to early maturation and height increases. These include the perceptions that they are “inactive or lazy”, “strong and tougher than others”, and “that they have no feelings and are unclean.”
- Body Image Disorder is seen in adolescents , usually speared on by peer and parental criticism about weight.
- This impact lasts long into adulthood!!!!



# The Three- fold Paradigm



THE POWER TO:

Promote  
Lean and  
Active  
Youth





# About POWERPLAY

- **POWERPLAY** is an intensive 8 week program designed to positively impact the lifestyles of today's youth.



The program includes:

- Comprehensive medical exam (physical, laboratory evaluations, cholesterol, hypertension)
- Diabetes prevention, asthma and obesity associated.
- Co-morbidities assessment
- Comprehensive consultation by a Licensed Pediatric Dietician, RD and continual progress assessment of both child and parent.



# About POWERPLAY

- Thorough evaluation of family environment and child by Licensed Child Psychologist, Ph.d. and ongoing follow up sessions.
- Artistic and Musical Therapy to complement behavioral modification education.
- Certified Fitness Experts in the fields of: Yoga, Tai-Chi, Aerobics, African Brazilian Dance, Hip-Hop, Kickboxing, Circuit training and Karate.



# POWERPLAYMD.COM



This Interactive Internet Website allows children and parents 24 hour access to a pediatrician and specialists; nutritional and healthcare information, and extensive reference data and content focused on childhood obesity.



# What to Expect

- The program involves one 2 hour session each week for 8 weeks.
- The first half of each session consists of practical , entertaining educational tools that expose the child to nutritional and behavioral changes he/she can immediately apply to modify their current lifestyle.
- These are taught through art, music therapy as well as improvisation.



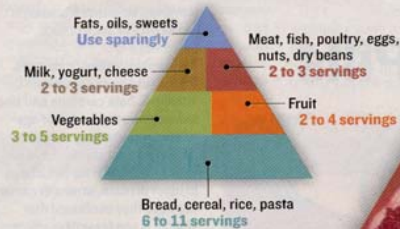
# ....What to Expect

- The second half of each session is dedicated to a unique and comprehensive fitness training curriculum.
- Each child will engage in varied physical activities such as yoga, tai-chi, African Brazilian Dance, hip-hop, kickboxing, aerobics etc..

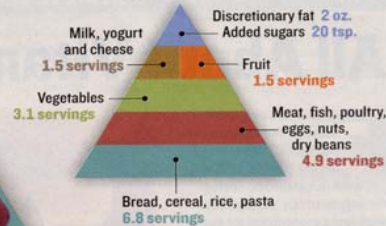


# Redesigning the Food Pyramid

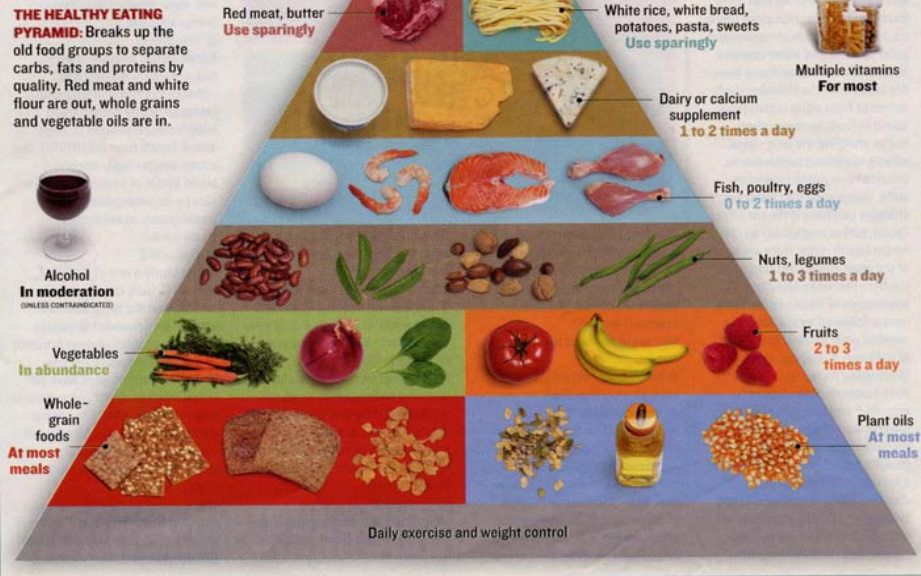
**THE FOOD GUIDE PYRAMID:** The government's 1992 effort to wean us from fat conveyed a sense that all carbs are harmless.



**THE AVERAGE AMERICAN DIET:** With a cherry on top. Sweets and meats are a bigger draw than healthful fruits and vegetables.



**THE HEALTHY EATING PYRAMID:** Breaks up the old food groups to separate carbs, fats and proteins by quality. Red meat and white flour are out, whole grains and vegetable oils are in.



# The New Food Pyramid



# Glycemic Index



“Low GI foods may prove an effective method for reducing calorie intake and achieving long term weight control”

Shauna D. Ball et al., Pediatrics March 2003



# Countering society's barriers



- Meal Replacements for low-income children at risk - No cost for patients selected ex: Delishia
- Medications (Meridia, Xenical.. FDA approved for 16 yrs old and up) for teens
- Weekly phone calls for kids w/ no social support
- Patient transportation
- One on One w/ Personal Trainer / Art Therapist / RD
- PowerBall competitions- Self esteem asset
- DDR machine and circuit training equipment
- Summer Camp , weekend hikes and activities
- Scholarships and stipends available for children w/ HTN, DM2, No insurance



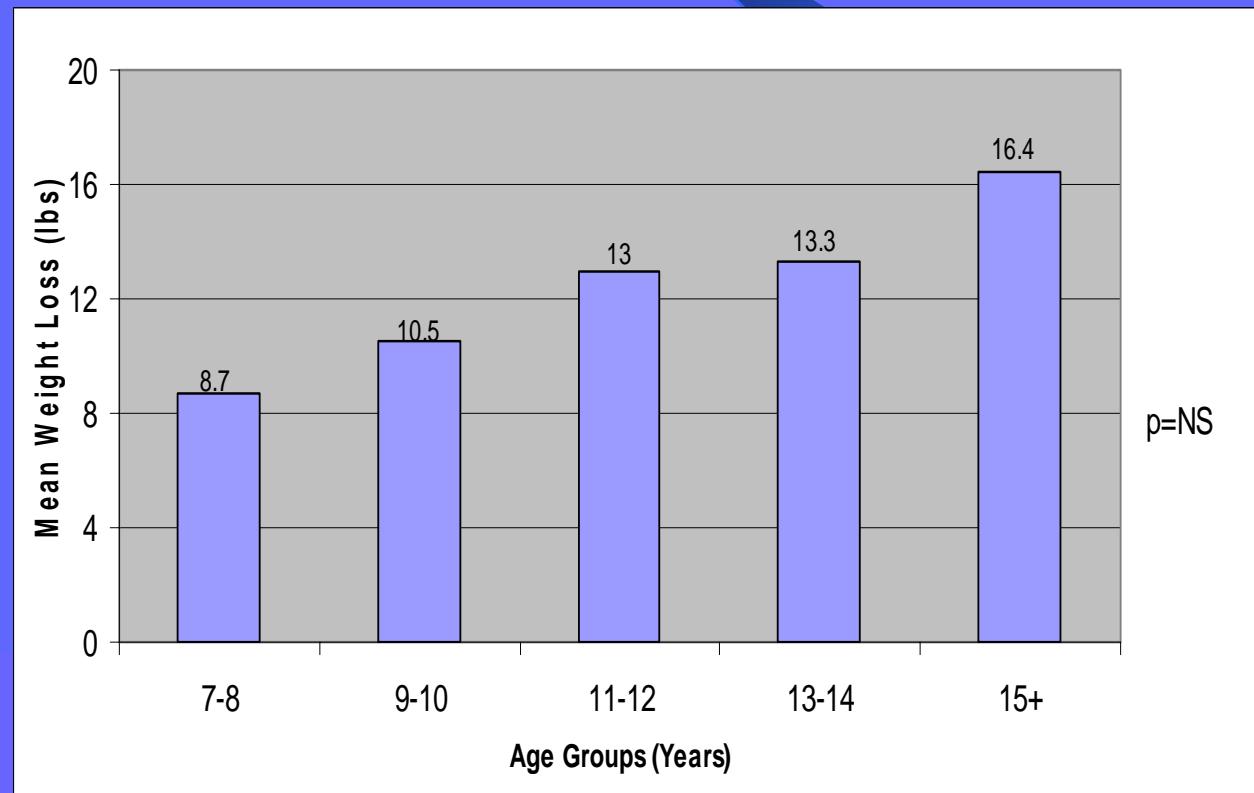
# Characteristics of Children Participants Over an 8-week Period of Power Play



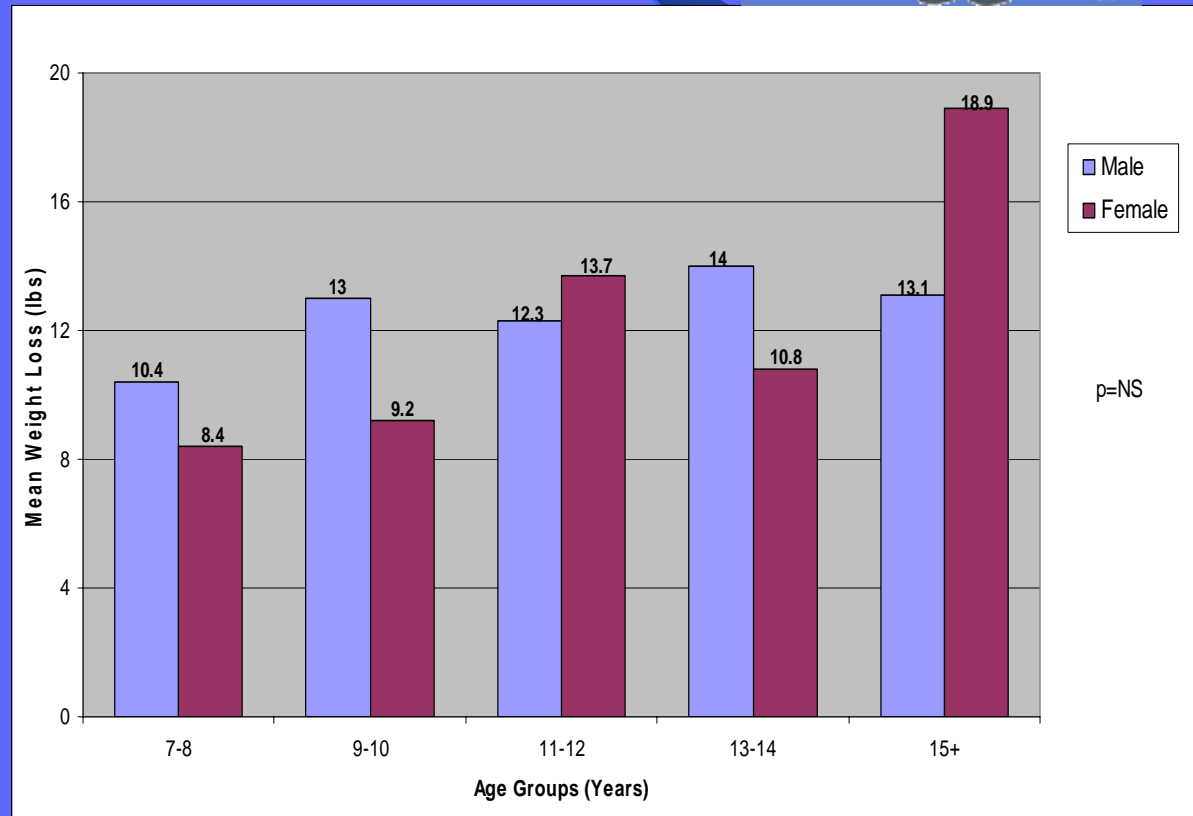
	Males (n=34)	Females (n=53)	Total (n=87)
Mean Age $\pm$ SD	12.1 $\pm$ 2	10.9 $\pm$ 2.4	11.4 $\pm$ 2.3
Mean Height (inches) + SD	62.3 $\pm$ 4.2	58.4 $\pm$ 5.2	59.9 $\pm$ 5.2
Mean Initial Weight (lbs) $\pm$ SD	186.7 $\pm$ 41.9	163.5 $\pm$ 53.3	172.5 $\pm$ 50.2
Mean Final Weight (lbs) $\pm$ SD	175.5 $\pm$ 40.5	154.95 $\pm$ 49.8	163.7 $\pm$ 46.9
Mean Initial BMI $\pm$ SD	32.9 $\pm$ 5.2	32.3 $\pm$ 6.6	32.6 $\pm$ 6.1
Mean Final BMI $\pm$ SD	30.6 $\pm$ 5.6	30.5 $\pm$ 6.3	30.5 $\pm$ 6.0
Race (%)			
Caucasian	47.1%	24.5%	33.3%
Hispanic	41.2%	60.4%	52.9%
African American	11.8%	15.1%	13.8%



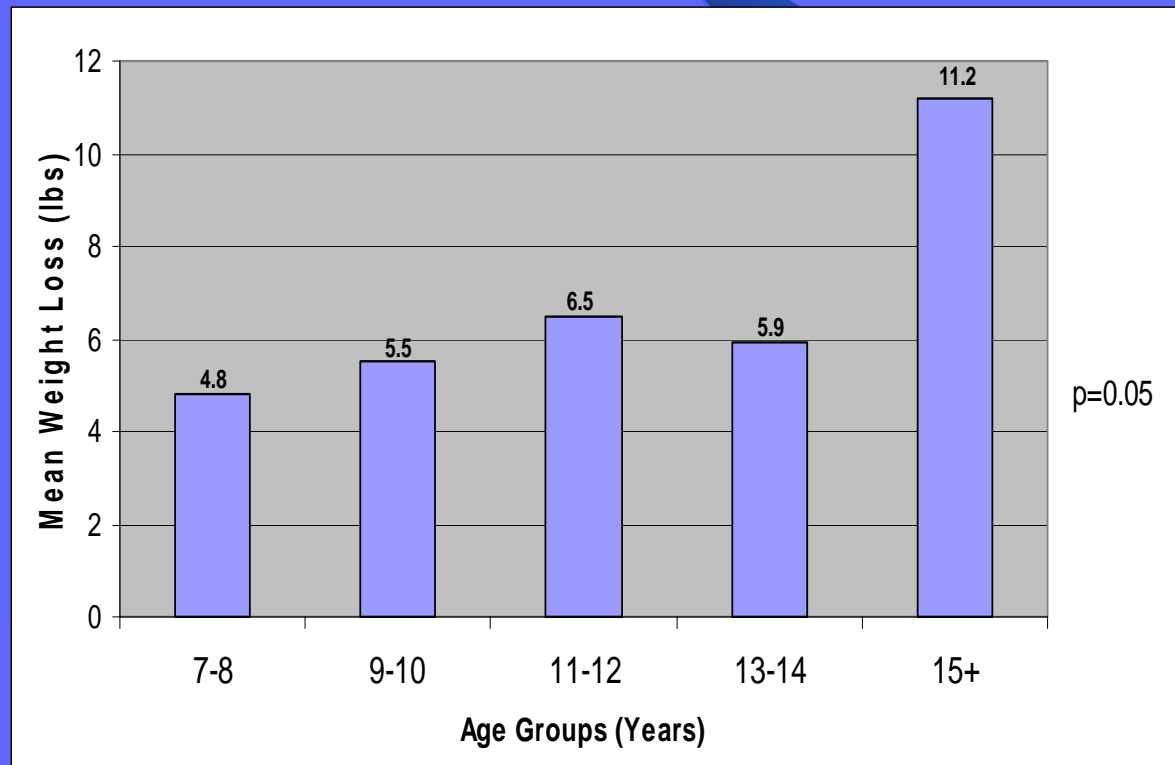
# Graph1a-Mean Weight Loss in Children Over 8-week Period vs. Age Groups



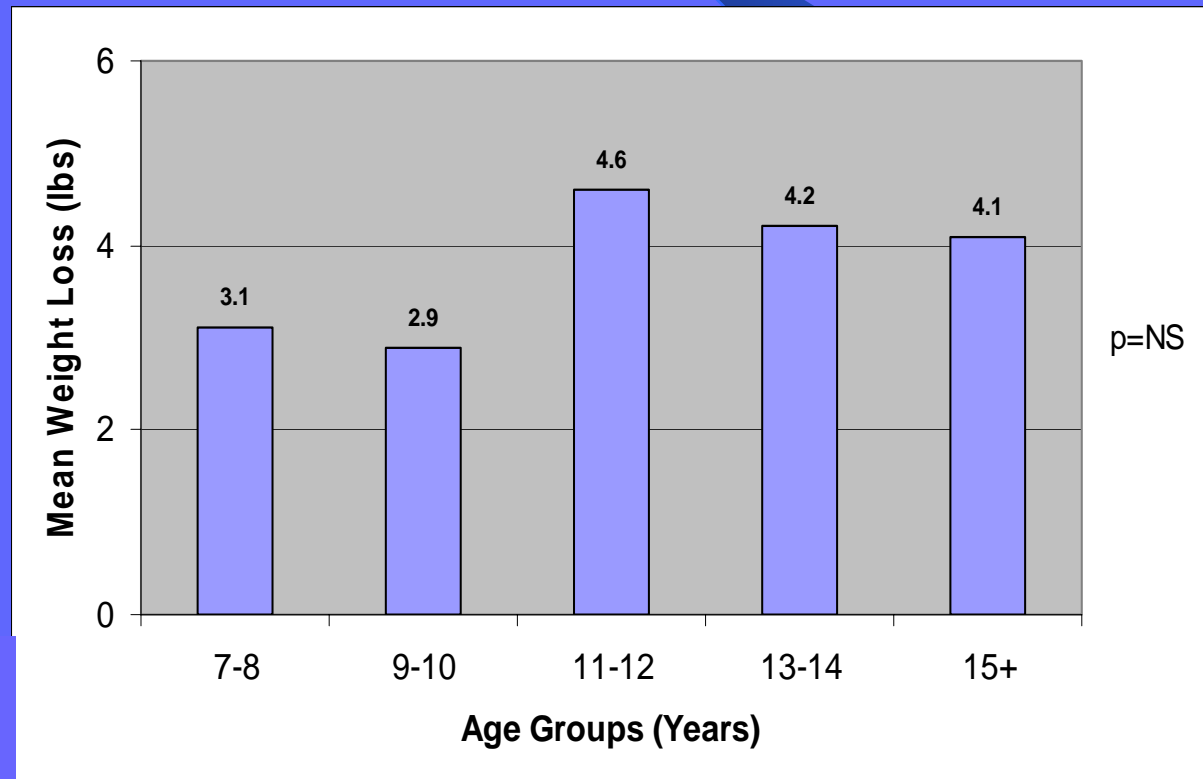
# Graph 2a-Mean Weight Loss in Children Over 8-Week Period vs. Age Group, Among Males and Females



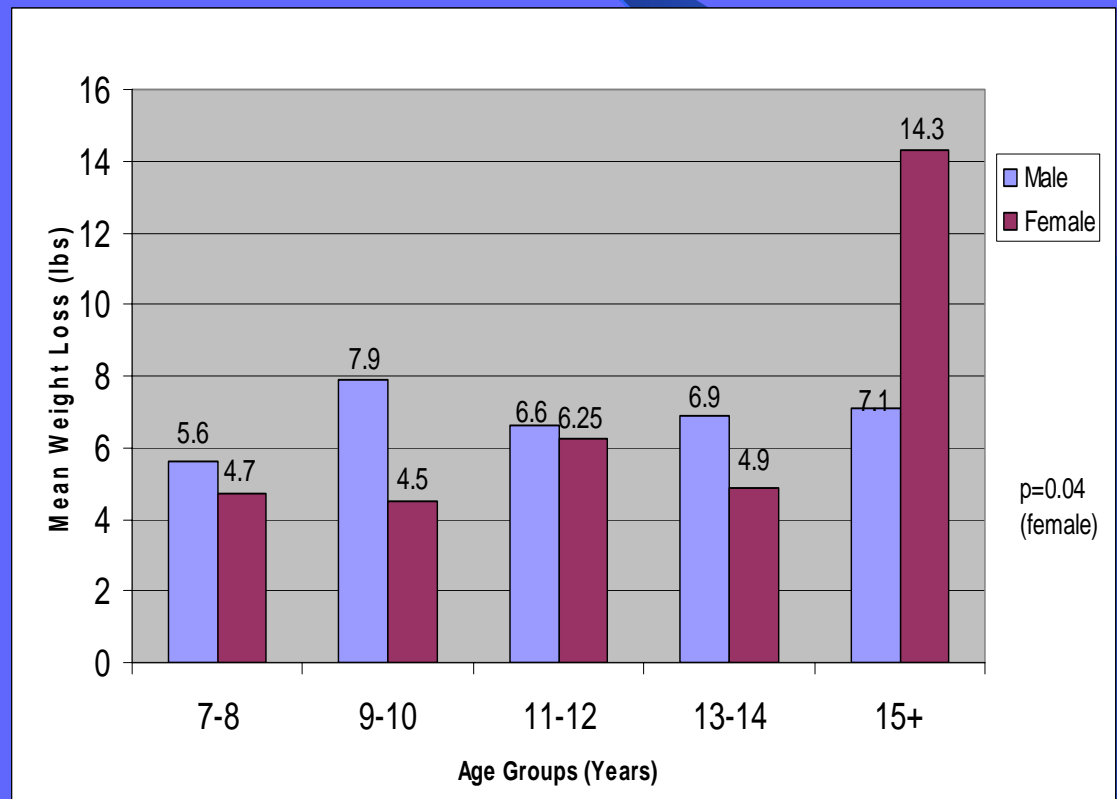
# Graph3a-Mean Weight Loss in Children Over Weeks 1-4 vs. Age Groups



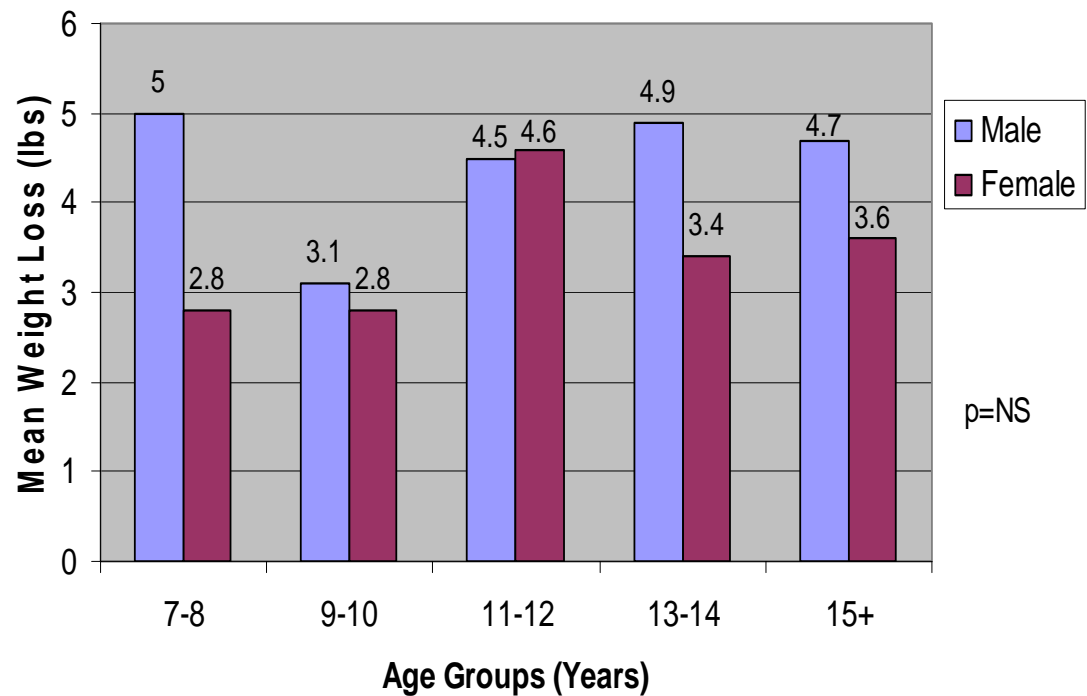
# Graph 4a-Mean Weight Loss in Children Over Weeks 5-8 vs. Age Groups



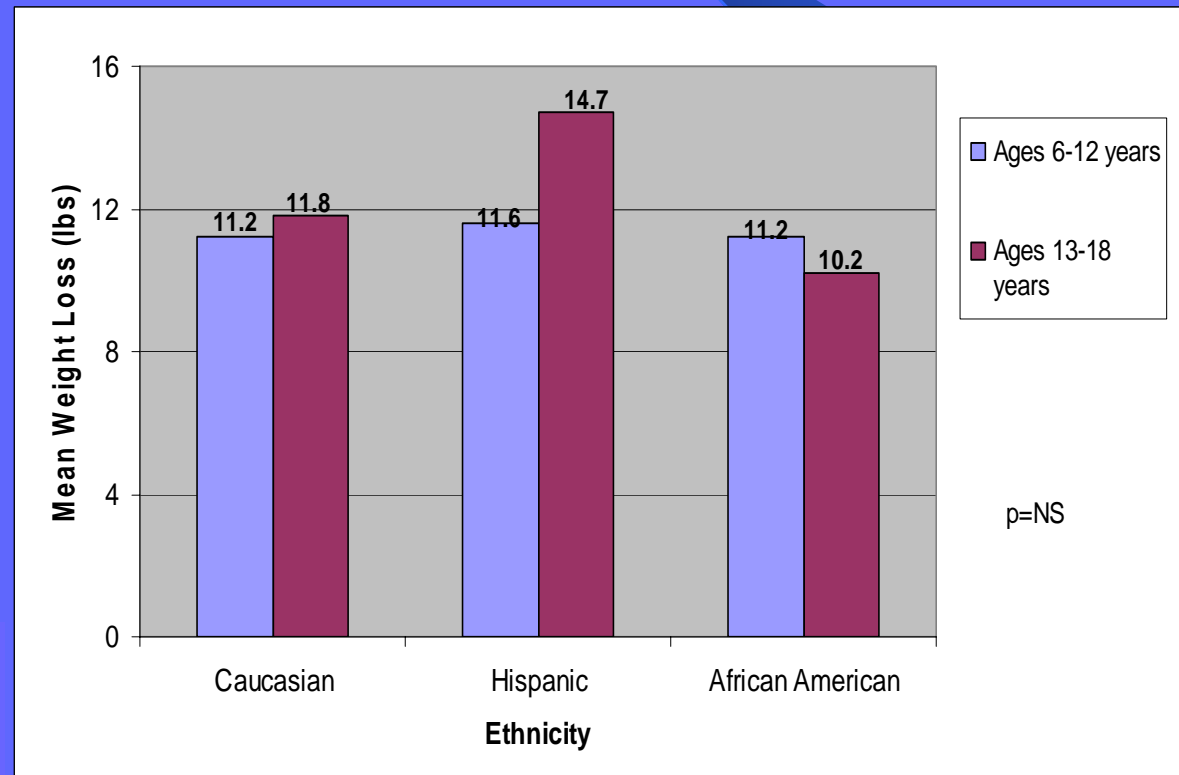
# Graph 5a-Mean Weight Loss in Children Over Weeks 1-4 vs. Age Groups, Among Males and Females



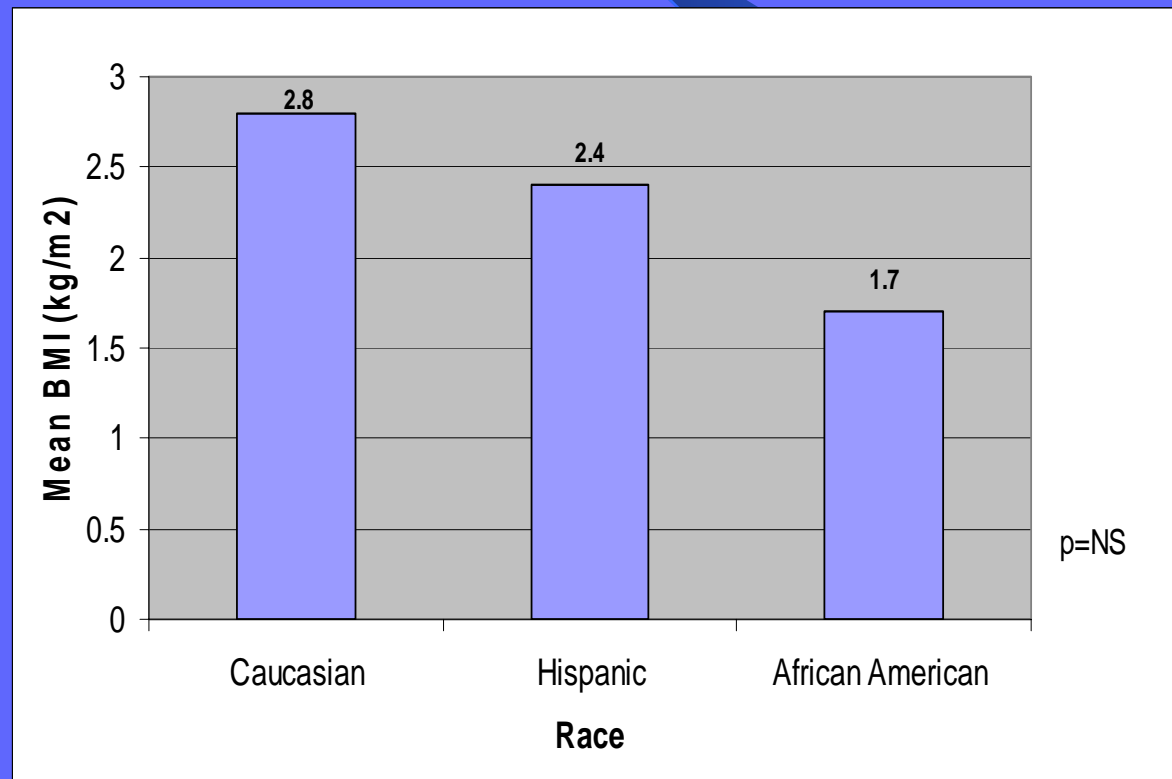
# Graph 6a-Mean Weight Loss in Children Over Weeks 5-8 vs. Age Groups, by Males and Females



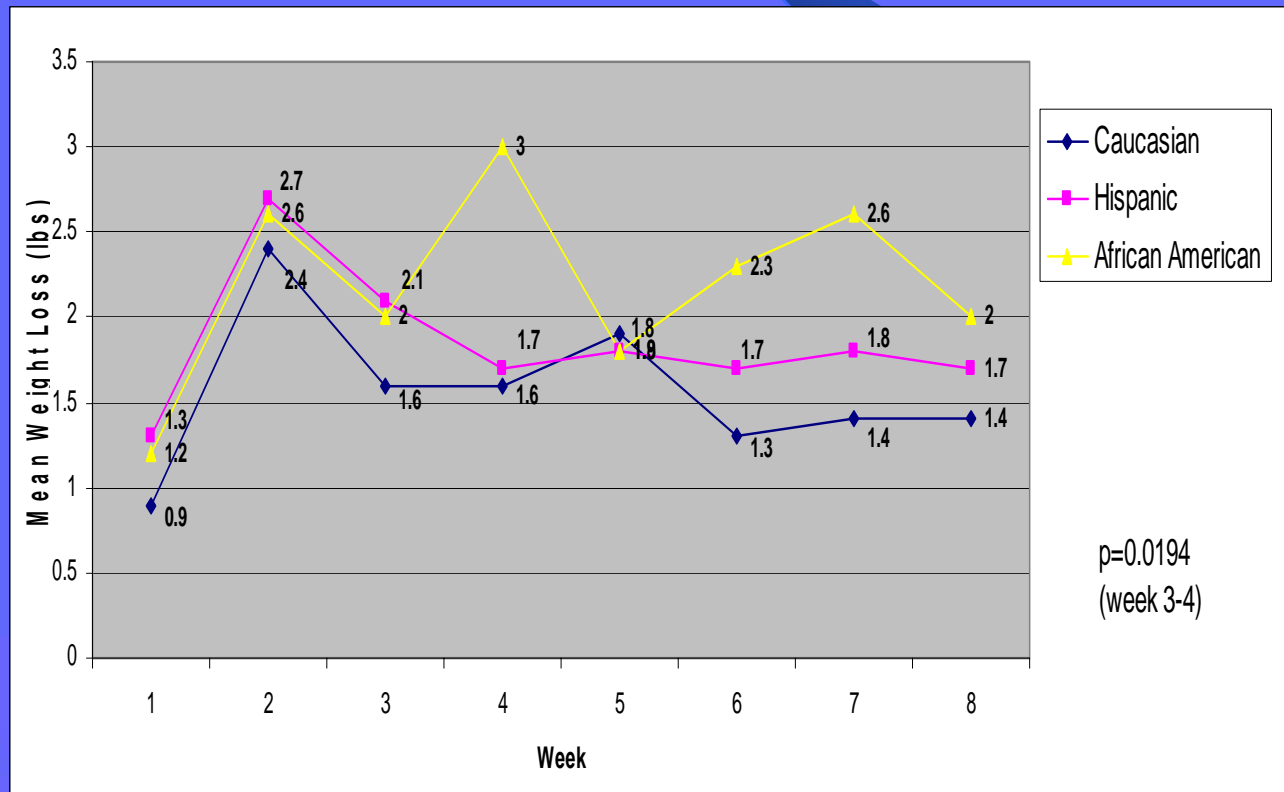
# Graph 7a-Mean Weight Loss in Children Over 8-Week Period vs. Ethnicity, by Age Groups



# Graph 11-Mean BMI values for Children Over an 8-week Period vs. Race



# Graph 13-Mean Weight Loss Among Children vs. Week, Among Race



# Our Kids



THE POWER TO..

Promote

Lean and

Active

Youth



# Alex

12-18-02

Age : 13  
Height : 5'7"  
Weight : 324 lbs.  
BMI : 51  
DX : M.O  
(Morbid obesity)  
HTN (152/78)  
Fmhx of Type 2DM

BEFORE



12-22-03

Age : 14  
Height : 5'7" in.  
Weight : 227 lbs.  
BMI : 35.6  
DX : Obesity  
HTN



AFTER

# Channing



**BEFORE**

04-10-00

Age: 16 yrs

Height: 5'9"

Weight: 326 lbs.

BMI: 48.2

DX: M.O.

HTN

H. CHOL.



**AFTER**

3-19-03

Age: 19 yrs.

Height: 5'9"

Weight: 277 lbs.

BMI: 40.9

DX: M.O.



# Yale

## BEFORE

09-09-01

Age : 10  
Ht. : 5'0"  
Wt. : 133 lbs.  
BMI : 26.1  
DX : Obesity  
High  
Cholesterol



## AFTER

01-27-03

Age : 12  
Ht. : 5'1" in.  
Wt. : 119 lbs.  
BMI : 22.2



# Christian



## BEFORE

06-25-01

Age : 12

Height : 5'6"

Weight : 292 lbs.

BMI : 47-

DX: DM2/ Insulin



## AFTER

03-04-02

Age : 12

Height : 5'6"

Weight : 192

BMI : 31.6-

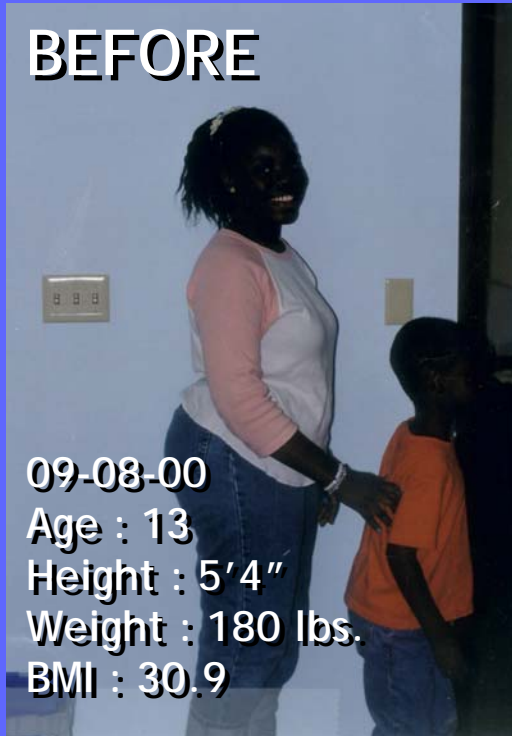
DX: DM2/

Glucovance



# Adwoa

**BEFORE**



09-08-00

Age : 13

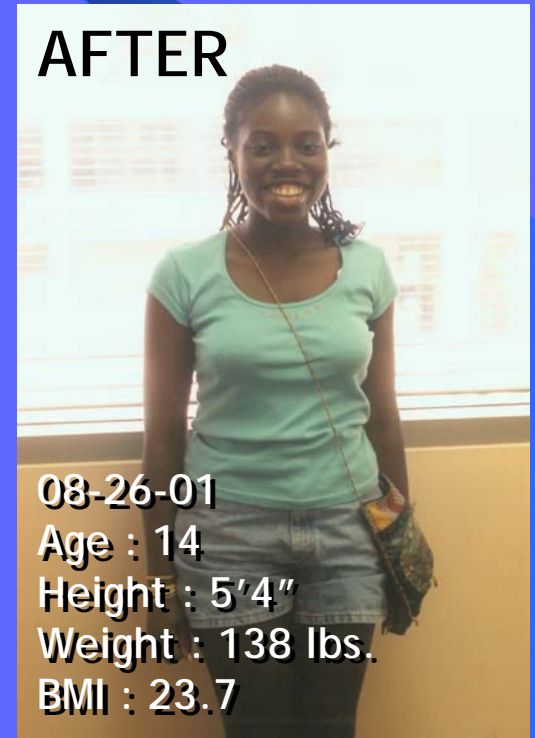
Height : 5'4"

Weight : 180 lbs.

BMI : 30.9



**AFTER**



08-26-01

Age : 14

Height : 5'4"

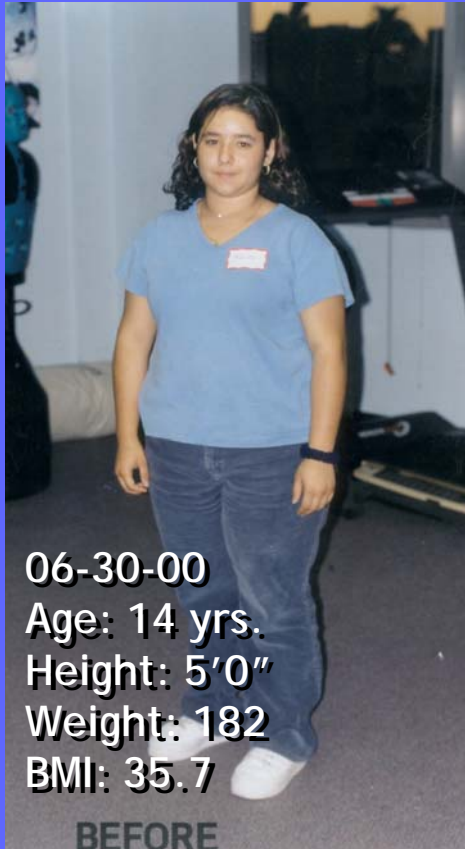
Weight : 138 lbs.

BMI : 23.7



BEFORE

# Melissa



AFTER



# DECREASE FOOD INTAKE

Glucose (140,149)  
Lactate (150,151)  
Pyruvate (150,151)  
3-Hydroxybutyrate (150,151)  
3,4-Dihydroxybutanoate (143)  
2-Buten-4-olide (143)  
5-Hydroxytryptophan (152)  
B2-Adrenergic Agonists (152)  
B3-Adrenergic Agonists (153-155)  
Serotonin (156,157)  
Propylgallate (158)  
Simmondsin (159)

Apoprotein IV (160)  
Bombesin (161,162)  
Cholecystokinin (CCK) (163-167)  
Enterostatin (168-170)  
Glucagon (GLP-1) (171-175)  
Gastrin releasing peptide (176)  
Insulin (177)



# INCREASE FOOD INTAKE

Monoamines and metabolites  
2-deoxy-D-Glucose (138)  
2,5-Anhydromannitol (139,140)  
Glucosamine (140)  
N-acetylglucosamine (140)  
1,5-anhydroglucitol (140)  
2-mercaptoacetate (141)  
Methylpalmoxirate (142)  
2,4,5-trihydroxypentanoate (143)

Peptides  
Insulin (144,145)  
B-Casomorphin (146)

# First and Always: Definite Family Strategies to Prevent Childhood Obesity



Division of responsibility re: feeding

- Do Not encourage eating
- Reduce parental control of quantity
- Educate on quality
- Eliminate forbidden foods/ Offer substitutes
- Control television time
- Increase physical activity
- Encourage a Positive and Nurturing environment



